

Abstract

The present invention relates to methods of ex-vivo expansion of hematopoietic cells by culturing hematopoietic cells in a growth medium comprising a chimera protein which comprises a variant of human interleukin-3 (hIL-3) which contains multiple amino acid substitutions and which may have portions of the native hIL-3 molecule deleted and a hematopoietic growth factor. The present invention also relates to the ex-vivo expansion of hematopoietic cells for gene therapy. Additionally, the present invention relates to the use of the expanded hematopoietic cells for treating patients having a hematopoietic disorder.